

Penguins Do Have Square Eyes

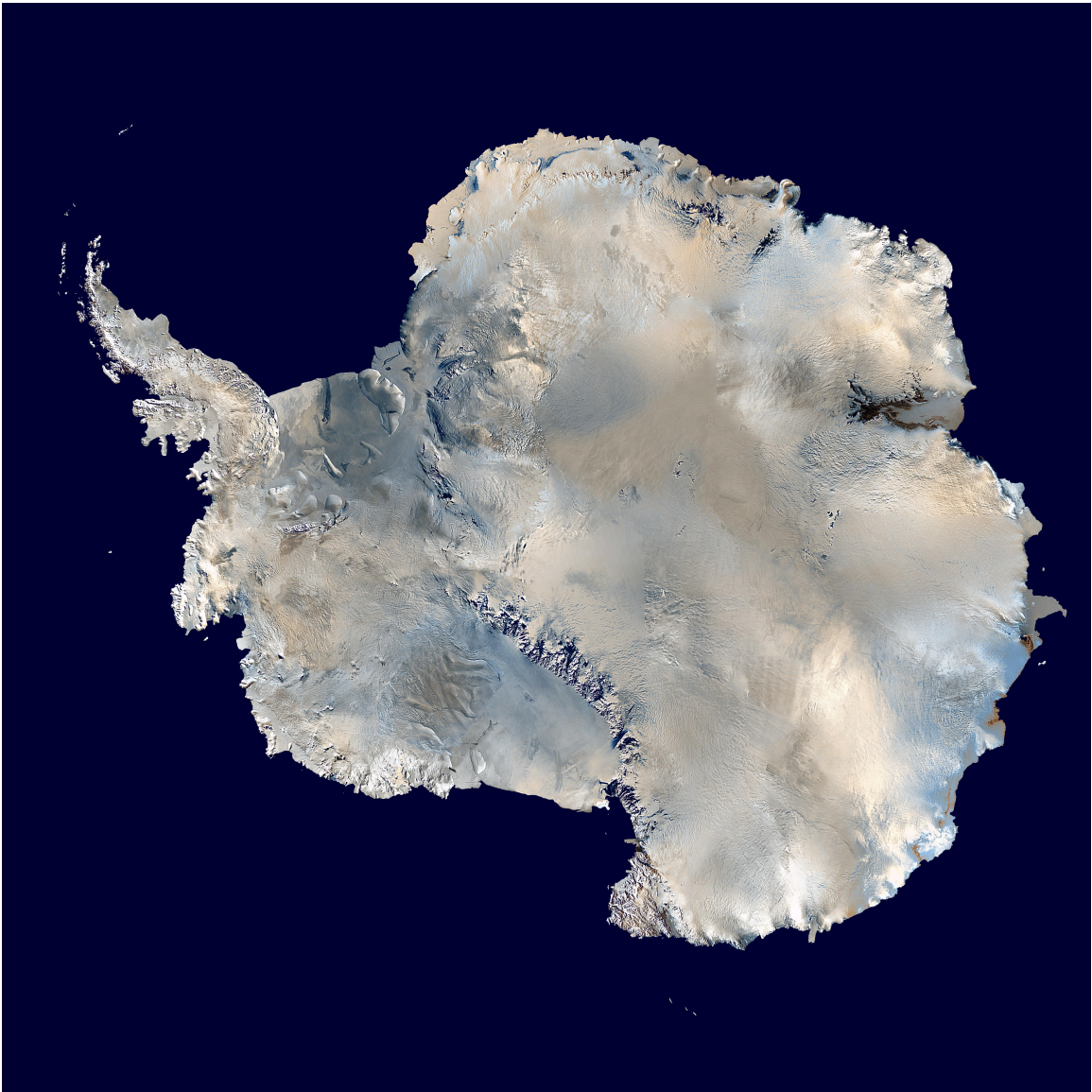
By

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Out Of The Blue

The First Expedition: 1962 - 1963

Andy Warhol is reported to have said that every man, no matter how humble, is entitled to his fifteen minutes of fame. If this is true, my fifteen minutes of fame would rest on my three trips to the Antarctic in the early to mid-sixties. In 1962 I was 42 years old I had just finished a Master's degree in geology at Texas Tech College, now Texas Tech University, and had accepted a job there as an instructor. One day my department head, Dr. F. A. Wade, like a bolt from the blue, asked me a strange question. "How do you feel about cold weather?" Somewhat puzzled, but not knowing where the conversation was heading, I answered rather casually "I have not had much experience with it but I can take it or leave it". He then fired a short but unexpected question at me—"How would you like to go to Antarctica with me?" The reply was a short but explosive "yes!"

Dr. Wade had applied for a National Science Foundation grant. They, along with Texas Tech, would sponsor the expedition. There were to be three of us, Dr. Wade, myself, and a young graduate student named David Greenlee. The three of us were to do geologic exploration along the Shackleton Glacier. It is one of the many large glaciers that bleed the ice from the polar ice cap at approximately ten thousand feet in elevation down to the much lower elevation of the Ross Ice Shelf. This entire ice shelf moves slowly downhill, and ultimately breaks off into the Antarctic Ocean as huge flat-topped icebergs.

This would not be Dr. Wade's first Antarctic experience. In his younger days he had had the good fortune to be a member of the 2nd and 3rd Byrd Expeditions, which both took place before WW II. Now he was a man over 60 years of age, and probably a little long in the tooth to be exploring in a place such as Antarctica.

Because of our ages, it was necessary for both of us to obtain a medical waiver, as we were both over the age of 40. It was necessary for all of us to take physical exams, and since the support of the exploration was under the control of the U.S. Navy, these exams took place at a naval station. The nearest such station was the Great Lakes Naval Station in Chicago. We flew to O'Hare Airfield, and finally found our way to the hospital at the naval station where we had no trouble passing our physicals. We ogled tall buildings, and ended up having a number of experiences, most which were new to a Texas country boy. We were able to see the Fields Museum, we attended a Cub's baseball game, we rode on a Chicago trolley, and finally we

got stuck in the middle of a Friday afternoon traffic jam, and almost missed our plane home.

Arctic and Antarctic

Upon hearing about the trip to Antarctica, I was often bombarded by silly expressions such as “Watch out for the polar bears”, or “How to you think you will get along with the Eskimos?” Of course there are no polar bears or Eskimos in Antarctica, so perhaps at this point some information about what is true and what is not true about this strange and mysterious continent is in order. One thing both areas have in common is miserable weather. Both can be bitterly cold, and often this cold is exacerbated by strong wind, creating a harsh environment for life forms during the winter months. And the seasons are reversed—when it is winter in Antarctica, it is summer in the Arctic, and visa versa. Both Arctic and Antarctic are frequently misspelled. It is possible to create a reasonable sounding spelling of Antarctica by leaving out both a t and a c. Both areas share the common factor of containing the axes of rotation of the earth. Both also share the commonality of having the magnetic poles. The magnetic poles and the poles of rotation do not coincide. The poles of rotation are fixed in place, but the earth does have a slight wobble or precession, which continues through very long periods of time. Meanwhile, geologically speaking, the magnetic poles migrate relatively quickly and with gay abandon. These differing poles are not widely separated today, however, and are within a few hundred miles of each other. Observation of these erratic shifting of the magnetic poles has been the basis for the formulation of one of the theories for proof of continental drifting called Polar Wandering.

In many ways the Arctic and Antarctic are exact opposites of each other. Antarctica is a true continent, while the Arctic is an ocean basin--a basin that contains an ocean that is frozen. It seems true that in the past in warmer climates, this ocean has thawed, and become a true ocean. While it is in most places frozen solid at the surface, it is ice floating on water underneath, and submarines can easily sail under the ice cap, and punch their way to the surface if necessary.

Ocean life is abundant around the continent of Antarctica due to the upwelling of currents that carry nutrients that is food for an abundant but minute shrimp-like organism. These are food for all kinds of sea life. In fact, the abundance of whales seeking this “krill” lured whalers southward, and contributed to the exploration of the southern continent. The Arctic supports an abundant sea life as well, but also has vast herds of caribou and reindeer, which are able to support Eskimos, and some Indian tribes. In contrast, in Antarctica, once you move inland, there are no land animals, and you leave behind the aquatic life along with the penguins and other birds, and enter a white frozen desert that is almost totally without life across its broad continental expanse. The paucity of life is such, that with the exception of special conditions where melt water exists for short periods of time, Antarctica is a dead continent. The special and exceedingly rare forms of life consist of mosses, small gnat-like insects, and lichens. Of these, the

lichens are by far the most abundant. Lichens, themselves, are rather strange organisms, being not one but two organisms, algae and fungi, living in a symbiotic relationship. They are extremely slow growers, and seldom appear as anything but a scrofulous looking growth on rocks. They are usually black or gray, but are sometimes yellow or orange. They can be locally abundant, and on the Shackleton, I have seen a whole cliff side covered with brilliant orange lichens. Several new varieties have been discovered in Antarctica, and one was supposed to have been named after me, because I found it, and showed it to a New Zealand biologist who was visiting us. He became very excited concerning it, and swore he would name it after me. But I never heard any more about it.

The Arctic, being an ocean basin, has no exposed rocks except for adjoining islands extending outward from the continents. Considering its large size, there are very few rocks outcropping in Antarctica. It is 97% covered with ice, and the few exposures are found along the coast, and where mountain ranges have poked their crests above the ice. Such rock exposures also occur along the walls of valley glaciers. Geologists seek out these rare locations of exposed rock. Hence our presence on the Shackleton Glacier. Scientists in other scientific fields in Antarctica do not necessarily have to look for bare rocks to ply their trades. Much exploration exists in Biology, Meteorology, Glaciology, and Seismology, just to mention a few.

Preparations

Back in Lubbock we continued with the many preparations we considered pertinent for the well being of our trip. I spent a lot of time in the library running down literature about Antarctica and making copies of it in order that we might familiarize ourselves with as much of the written material concerning Antarctica as possible. I ended up with a sizable portfolio. There were a hundred other chores to do. We had to secure sunglasses (Wades and mine were prescription). I was officially designated as the chaplain through the efforts of our pastor, Reverend Schindler, and the local unit of the Naval Reserve, and presented with a bible. We even invested in a case of empty, but new paint cans to be used as water proofed food containers.

We had one more trip we had to take before we made the far trip south. We attended a meeting in Washington D. C. to meet the other scientists who were also to be in Antarctica. They were an eclectic group being from many different fields. I remember Dr. Penny from the New York City Zoo, who worked with penguins. Also there were a group from Ohio State University who were doing geologic work in the Horlick Mountains, not too far from the Shackleton insofar as Antarctic distances go.

We returned to Lubbock, and it was only a short time later that we were assembled at the airport to begin the first leg of our long trip south. We received an enthusiastic sendoff from friends and relatives, and bravely took to the air via Branif, then known as the largest non-scheduled airline in the world—our destination, San Francisco. We spent the night there, and the only thing that I remember about it is that we attended a nightclub near our hotel that seemed to specialize in Greek food and dancing. The dancing became frenetic, with the frenzy increasing proportionately with the amount of alcohol consumed. The evening ended up with everyone pounding their beer mugs on the table and shouting, “Play the wheat song again”. We flew out the next morning to Hawaii via a commercial airline.

We stayed in Hawaii for three days waiting for transportation south. So far we had been having what amounted to a weekend Hawaiian vacation.. We even swam and spent time on Waikiki Beach. To tell you the truth, it isn't much of a beach. It is quite small and keeps losing its sand, so that sand



**V. L. Yeats, F. Alton Wade and
David Greenlee depart Lubbock
October 7, 1962**

has to be hauled in to maintain it, It just happens to be in a fortunate location in regard to the tourist hotels and the city of Honolulu. We also became addicted to Hawaiian seafood and fruit. I fell in love with Mai-Mai, which I understand is the dolphin fish and not the mammal. I also became enamored with the papaya, which I preferred over the pineapple, although both are excellent.

New Zealand

Our next flight was a rather long one from Hawaii to New Zealand via Kiwi Airlines. New Zealand consists of two large islands, unimaginatively called North Island and South Island. The largest city on South Island is Christchurch. Upon landing there, we were required to fall out for custom inspection after having received a healthy fogging of insecticide in the plane. Our passports were examined, and we finally realized that we were entering a foreign country. Baggage inspection included a very thorough search for salacious material, especially playboy magazines, which were illegal in New Zealand, and were eagerly sought and confiscated by the custom inspectors. The invasion of New Zealand by the Yanks in the guise of scientists was just under way, and the natives were somewhat in awe of us, and a little bit apprehensive. Generally they liked Americans very much, and still remembered whom it was that saved them from a Japanese invasion during World War II. It is ironic when you think about it that both Australia and New Zealand stripped themselves of their fighting forces to help England repel Rommel in North Africa only to find themselves defenseless against the Japanese hordes.

The New Zealanders are more English than the English. Isolated as they are, they seem to lag behind in styles and customs, still doing things in the old way. It may have been more apparent then, as that was in 1962. They drive on the left side of the road, and at that time still used pence, shillings and pounds for their currency, with a most aggravating coin called a florin. They also had a large coin similar to our silver dollar called a crown. These were only issued as commemorative coins, and were never found in circulation. They have since changed their coinage. The cars on the street were mostly American made, but I was astounded at their age. Apparently they drove their cars forever. I counted three Essex automobiles in one city block. The city itself was beautiful. It was astral spring in October, and all the flowers were in bloom. There was a river running through the town, and it had a large number of parks, upon which young people could be seen playing cricket. Their houses were neat and well kept, but what impressed me most was that there were no slum areas. Most of the houses had no screens, as flies and mosquitoes do not seem to be a problem there,

We were bivouacked at the Carlton Hotel, and our host was a jolly Irishman called Mr. O'Malley. This old tavern turned out to be a delight, and we stayed there every time we went through New Zealand. In the morning the maid would give a preemptory knock on your door and burst into your room bearing a cup of tea and a biscuit along with a cheery good morning, and quite often catching you skimpily clad, which bothered her not at all. Meals were in the dining room and were very formal. You sat at tables covered with linen, with fancy folded napkins, and a full set of silver. There was a different menu on the table every day, and you gave your order to your waitress. You were assigned a seat, and that was your seat for the duration of

your stay, and was reserved for you. Changing your seat was frowned upon. The food was ample and excellent. It usually included soup, a fish and or a meat dish, fruit and a dessert. Tipping was not expected, and any gratuities were made at the end of your stay. New Zealand is a dairy country, and they have an abundance of cheap cream and butter. Also, they serve wonderful puddings for desert.

It is also a sheep country. With my remembrances of the mutton stews I endured in the South Pacific, I always try to avoid any food that might even have come near a sheep. In ordering, you had to be careful. They had a tendency to hide the origin of the food under innocent and misleading names such as colonial goose, which was not goose at all, but some form of mutton. You could always get beef, but sometimes you had to look for it. It was always best to ask the waitress.

Many countries have strange liquor laws, and New Zealand was no exception. The public bar part of the hotel was open only a few hours a day, but as residents we were entitled to buy at the bar inside the hotel at almost any time. It was also open to the public, but only at restricted times. The real cash cow for the Carlton was its wall-to-wall beer garden at the rear of the hotel that was open only on weekends from one until six. During that short period of time it appeared as if all of Christchurch was determined to make up for lost time by drinking as much beer as they could in this period of time. Of course this resulted in a number of people getting uproariously drunk. We used to watch this performance from the relative safety of our upstairs hotel window. Regular beer spigots could not dispense the beer fast enough, so that they used an attachment that looked like a garden hose with a cut off attachment on the end that was capable of filling pitchers rapidly. I suppose that this tap beer was good, but we preferred to drink Honaker bottle beer, a brand that was a dead ringer for Heineken in every way, but was a local beer and very reasonably priced.

We were given our final physical exam and issued our cold weather clothing at the USARP Depot. These initials stand for United States Antarctic Research Program. I was impressed by the quality of the clothing. It consisted of the following:

- two sets of waffle weave long john underwear,
- two mackinaw wool shirts
- nylon windbreaker pants
- a nylon anorak with a hood ringed with wolverine fur (wolverine fur does not frost over)
- a heavy-duty coat with hood for extremely cold weather
- a padded cap with ear flaps, a watch cap
- a ski mask, a pair of heavy gloves
- two pair of light-weight gloves to be worn under very heavy mittens for very cold weather

- a very complex set of footwear consisting of a pair of bunny boots very much like an athletic tennis shoe only heavier, and useful, we found, for wearing only in the area of McMurdo.

More practical were the mukluks. These were a system of footwear patterned after that worn by the Eskimos. Over sox were fitted soft sheepskin slippers with the fur turned inside. These in turn were incased inside another set of sheepskin boots, and all these were inside a heavy rubber and nylon boot.. All this clothing was packed inside a heavy nylon bag colored bright orange., which was reminiscent of my old navy sea bag. All that was missing was my ditty bag.

McMurdo

At last the time arrived for us to make our final leg of the trip to the white continent, and we were loaded aboard a monstrous four-engine Hercules cargo plane. It was already loaded down with a huge assortment of parts for repair and maintenance of the many mechanical devices at McMurdo. All this was quite different from the luxury accommodations we were used to on commercial flying. I found myself sitting on a narrow canvas seat staring at an enormous box of something or another that blocked my view of every thing else on the plane. Meanwhile we were flying over 1500 miles of angry ocean, faced with the comforting thought that if the plane crashed, you would last only about 30 minutes in the water before you froze to death. It was a long, uncomfortable, boring flight over inhospitable waters, and it has been called the most dangerous flight in the world.

They began to indoctrinate us against the cold by gradually reducing the heat on the plane, which required us to start donning more clothing. By the time we reached McMurdo, we were fully dressed in our Antarctic gear. We were greeted by a beautiful view of Mt Erebus with its stream of hot gasses vaporizing in the cold Antarctic air. It was a good thing that we were fully dressed. As we tumbled out of the plane at Williams Airfield, we were faced by a biting cold wind, and the temperature was 37 below zero. So much for Antarctic summers. I would have preferred to crawl back aboard the plane, but a shivering USARP representative was there with a truck to haul us to our quarters at McMurdo. That was the coldest temperature I was subjected to while in Antarctica, and thank God for that.

McMurdo station is the center for all American Antarctic exploration. In the austral summer it has the appearance of a small city. Its one long main street teems with activity. Trucks, jeeps, and other vehicles compete with streams of pedestrians heading in both directions on this main thoroughfare. At one end is the USARP storage and warehouse, along with other Navy storerooms. Down the street one block is the famous USARP chalet, of which we will say more about later, followed by USARP barracks and the chapel. Beyond this, Navy CB units dominate the area, which includes the mess hall, the head, officer and enlisted men quarters, the communications shack, repair shops, fuel depots, sickbay, the post office, and food storage units.



McMurdo Station - 1963

This mélange represented an unusual but workable marriage between civilian scientists and the military. Some compromises were necessary. As

scientists we were given the courtesy officer rank, but without military authority. All disputes were handled by the USARP representative and the Admiral in charge of the base. The system worked well, and there was very little friction between the two different groups. Some of the differences in rank tended to disappear. Officers, enlisted men, and scientists used the same mess hall and same head. In other words, we ate together and peed together, and how much more democratic can you get?

Equipment and Supplies

We were quartered in a Jamesway hut at the base, and immediately went to work preparing our equipment. We were to be dropped at the foot of the Shackleton Glacier, and from there to proceed to explore as many of the rock exposures as possible before the end of the season. Transportation was to be by means of motorized toboggans. These were experimental machines at that time, and we and other Antarctic exploration teams were the first to utilize snowmobiles, as they became to be known. They were wonderful machines, and were ideal for snow travel. They had skis on front for traveling on snow and were powered by a Briggs and Stratton air-cooled engine similar to those used on a lawn mower. It had variable pitch pulleys that automatically adjusted their ratio to accommodate themselves to the speed of travel and the load being pulled, eliminating the need for a transmission.

The motor powered a series of raddels on an endless chain that ran under the toboggan and pushed it forward very much like the paddle wheel of an old time Mississippi riverboat. Top speed was about 20 miles an hour, but with the loads we were pulling, the speed was nearer to 4 miles an hour, a brisk walking speed. We had two machines, and each pulled two Nanson sleds. Dave Greenlee and I each drove a toboggan, and Dr. Wade walked for the most part. When he got tired he would hop up on the nearest sled and ride for a while. The toboggans were fully equipped and ready to go, but the Nanson sleds were not, and had to have rope harnesses made. Dave took care of this, as he turned out to be a better cowboy than I was a sailor.

USARP provided a large storehouse that furnished us with all the paraphernalia necessary for field operations. We had to carry enough food, fuel, and equipment necessary to last us for three months, and if we forgot anything, there was no country store handy for us on the Shackleton. Our equipment included a small set of tools and a sheath knife for each of us.

Gasoline was for use both for the engines and for our Coleman stoves. We used these stoves both for cooking and heating. For practical reasons we used white gasoline only. The toboggan engines seemed to run well on it, and it was impossible to use leaded gasoline on the Coleman stoves. Wade used a tiny Primus stove that was more cute than practical. He had used one on the Byrd expedition, and it was one that he was familiar with.

We each had an arctic sleeping bag, which was at least twice as heavy as an ordinary one, a sponge rubber sleeping pad, and two blankets. We had three tents, one for Greenlee and I, one for Wade, one for our stores if we had unpacked them. They were specially made, with an interior lining. This doubled cloth with an air space in between helped to insulate them and hold in the heat. They were quite comfortable if the sun was shining on them, but if the wind was blowing the snow so that it blocked the sun, or if we set up camp in the shadow of a cliff, (which we soon learned not to do), they would become very cold.

We had a small medical kit that contained among other things, a quantity of morphine. Thankfully we never had to use it. We each had a pair of cross-country skis, which we did not use very often.. Wade was very good on them, Greenlee was fair, and I was very awkward. Also included in our equipment was a collection of various colored trail flags and bamboo poles to fasten them on. These were used to mark a trail or a location. We also each had a Brunton compass, a notebook, a rock hammer, and hundreds of sample sacks. We had tape measures, a small magnet, a hand lens, and a small bottle of hydrochloric acid. A small scale, pencils, pens, and felt markers were carried along with our notebook for keeping notes and a record of the days progress. These were kept in a leather carrying case that was fastened to our belt.

We had a simple assortment of cooking utensils and cutlery, along with cup towels, face towels, and soap. The latter was just for washing our hands and face, as there was no way that we could take a bath the whole time that we on the Shackleton. Water was not available. There was ice, ice, everywhere but not a drop of water to drink. We had to laboriously melt the ice for all our drinking, cooking and washing water. We each had a bottle of whisky that we seldom drank. Whiskey does not become frozen at 20 below zero, but if drink it at that temperature, it will freeze your gut. The whiskey was a gift from the USARP. It was whiskey that had been confiscated by the government for some reason or another.

It was scotch and called Heather Whiskey. We became so fond of it that we named a chain of hills the Heather Hills, because, we said, it reminded us of similar hills in Scotland. This was a gigantic farce propagated by Wade on the geographer who worked on the Board of Geographic Names. Months later he wrote Wade in great puzzlement saying that he had searched the maps of Scotland and could find no Mount Heather. He was quite chagrined when Wade, laughing uproariously, gleefully told him of the hoax.

Our food was quite simple. We had oatmeal, powdered milk, dehydrated potatoes, and powdered eggs. What we did not have was vegetables and bread. I think that I missed the bread more than anything else. We also had an abundance of food bars, which, when broken up and cooked in water, produced a kind of soup which old Antarctic hands called *hoosh*. It was supposed to be nutritious, and to contain all sorts of vitamins, but it tasted terrible, and we soon avoided eating it whenever possible. We did have a few frozen steaks, and we usually saved them for a special treat. But best of all was an abundance of canned mixed nuts and Cadbury chocolate bars. Those we loved. When working hard on the ice, we needed about 3,500 calories a day. But even when we stuffed ourselves on chocolate and nuts, we all lost weight.

We had a number of paperback books, writing materials, but for entertainment we played cribbage. I beat Wade 32 straight games—a record that has never been beaten.

We had a quite complete set of field equipment. We had several nylon ropes, and an assortment of climbing gear consisting of pitons, piton hammers, carabineers (snap on steel rings for ropes), and crampons for walking on ice. We each had an ice ax and a set of cross country skis. Fuel, motor oil, and a few spare parts for the toboggans rounded out our supplies. Although we each had a toothbrush, and we did have enough water to brush our teeth, we neither shaved nor took a bath during the three months we were in the field.

On the Ice

It took us only a few days to be ready to leave for the field, but we had to wait several days for transportation. The Navy was usually behind in their schedule in transporting the field parties to their location. Meanwhile, we chafed at the bit, swapped stories with fellow scientists at the chateau, drank a little whiskey with the officers at the club and watched old movies.

The day finally arrived when weather and transportation came together and we loaded out two toboggans and three Nanson sleds along with all our food, tents, gasoline and other miscellaneous paraphernalia aboard a weary-looking RD4, and took off for the Shackleton glacier. The glacier looked beautifully simple from 10,000 feet of elevation, but when we finally landed, it looked cold, lonely and dangerous.

We landed a mile or so out on the ice sheet at the mouth of the glacier. It was an easy landing for the plane that was equipped with snow skis for landing on soft snow. It was not so easy to set up camp because of the depth of the snow, and we floundered



around quite a bit that first day. The weather was mild, and of course, we had constant daylight to work in. In short order, we packed everything aboard the Nanson sleds, started our toboggans, and made for the first rock outcrop at the right side of the glacier. The toboggans pulled nicely, and the gentle slope uphill was no problem for them. We felt like real explorers when we arrived at that first rock outcrop and banged away at it in true geologic style.

Our purpose in being at the Shackleton was to prepare a geologic map of the rock exposures and write a geologic report. Our plan of operation was simple. We started out on one side of the valley wall taking rock samples as we traveled along. We tried to stay as close to the valley wall as possible in order to avoid the confusion of the jumble ice formed outward from the valley side from the forward movement of the glacier.

Glacial ice is far from stable. A glacier is actually a river of ice, and it moves downhill under the force of gravity just as water in a river does. Unlike a river of water, the ice is a solid and can create a tumbled surface. Cracks created by the movement are called crevasses and large ones create a dangerous surface to travel over, particularly if the cracks are concealed with a deceptive cover of snow. The snow often forms a thin veneer or bridge which covers the cracks, and unwary explorers sometimes punch through these snow bridges and tumble into a rather mean environment of jumbled ice at the foot of the chasm. Toboggans and skis tend to distribute weight

over a larger surface, while a man's foot concentrates the weight in a small spot, and is much more likely to crash through a snow bridge.

The shallow ice thickness near the glacier wall, while possibly presenting a rough surface, was not as likely to have deep dangerous crevasses. Much trouble was encountered where tributary glaciers entered the main body of the Shackleton. It was then necessary to travel out into the main body of the glacier to go around the jumble destruction caused by the entering of the ice from the tributary glacier.

Our plan of exploration was to travel up the glacier as far as time permitted and then cross the main glacier and come back down the opposite side back to the mouth of the glacier where we would be picked up by plane.

We learned a lot about traveling by toboggan. These toboggans were wonderful machines under optimum conditions. We soon discovered a number of problems that had to be addressed. They could be braked easily by simply letting up on the throttle. The machine, which did not travel very fast anyway, would come to a quick stop. The Nanson sleds, however, were something different. They were built to travel with very little friction on their smooth runners. Thus, while the toboggan could be stopped quickly, the trailing Nanson sleds could not. In traveling down-slope, one would very likely look up and see the sleds passing by, and when they came to the end of their tether, there would be a violent jerk, and they would turn over and dump their cargo. After this happened a few of times, we knew something had to be done. We solved the problem by putting the Nanson sleds behind one toboggan, and hooking the other toboggan to the rear of the last sled. By keeping the lines taught, the Nanson sleds were compelled to follow in line.

Another problem we encountered was the inability of the toboggans to travel on surfaces other than snow. Their forward motion was created by a raddles or slats, which travel on an endless double chain. They worked very much like the old riverboat paddles, but instead of water, they pushed against snow. What we didn't expect to see was the bare ice surface of the glacier instead of snow. When bare ice was encountered the raddle and chain assembly could not make a purchase and would beat helplessly against the ice without moving forward. This was a problem we could not solve and we tried to avoid what we called "glare ice", and instead sought patches of snow wherever we could find them.

Our recommendation to solve this problem was for the manufacturer to install sharp points on the metal raddles, similar to the ice crampons we wore on our feet when walking on ice. You cannot imagine how slick and treacherous glare ice can be. or how suddenly and unexpectedly you fall while trying to walk on it, or how hard you hit the ice. Once you have had such a fall, you never want to have another, and you do not forget to put your crampons on when such glare ice is encountered. It is impossible to walk on such ice without crampons. We encountered this same traction problem with rock debris when we tried to cross the glacier.

A photo of the Shackleton shows a streak of debris down the middle. This was Swithenbank Moraine, a mass of soil, rocks and boulders being carried on the surface of the ice. In some places it was a mile wide and we had to cross it to get to the other glacier valley wall. The toboggans were built to travel on snow, not rocks, and we had to manually push them across the debris of the moraine. Although physically exhausting, we usually could move the machines across rough debris, but when ice was encountered, we had to resort to the crampons in order to get traction.

Swithenbank Moraine is a very large medial moraine, which runs down the center of the glacier. This moraine is continuously being absorbed into the glacier as the heavier rock and soil melts its way into the ice and sinks downward. As this moraine disappears into the glacier, more glacial debris is continuously being added as the tributaries contribute their loads to the larger moraine. Photos of the Shackleton show the dendritic pattern produced by this process. The solid moraine material added by the tributary glaciers tends to balance out the loss caused by the downward sinking of the main moraine material beneath the ice's surface. By the time the moraine approaches the ice shelf, there is no debris left, and Swithenbank Moraine has completely disappeared into the ice.



Shackleton Geology

The rock formations composing the outcrops seen on the Shackleton consist of two large subgroups. The older of these is called the basement complex. These are rocks of Pre-Cambrian and early Paleozoic Age. The lower part of these basement rocks consists of metasediments and extrusive igneous rocks, which themselves have been metamorphosed. These are thought to have been geosynclinal deposits that have been regionally metamorphosed. The result is a sequence of graywakes, slates, phyllites and schists. The grade of metamorphism is mostly greenschist facies. A second series of rock lying on the lower portion of this basement rock is a sequence of metasediments consisting of quartzites, hornfels and marble. This probably represents a regional metamorphism phase of shallow marine sediments.

These basement rocks themselves also have been intruded by large volumes of igneous rocks of Ordovician-Silurian Age, and subsequently were eroded and leveled off. On this erosion surface was deposited a series of sedimentary rocks of large aerial extent. They are mostly flat lying although some have been locally tilted in large blocks. These are continental deposits that have been named the Beacon Sandstones. This is a very thick formation of sandstones and it boggles the mind when you consider the enormous amount of quartz rock it took to produce such a thickness of sand deposition.

Overlying this thick sand deposit are sediments of silts and shales. The upper part of the Beacon complex consists of thick sequences of sandstones and shales. It is in this formation that the Antarctic coal deposits are found. We did not find any material that could be called coal, although there were some sediment that contained considerable amounts of organic material. The extreme upper portion of the Beacon Sequence of sand and shale deposits contains petrified wood. A large tilted block of sandstone of the Beacon Formation formed a large prominence called Mount Butler. We spent a considerable length of time measuring and taking samples of this massive chunk of real estate.

We made twenty-one different camps during the sixty-five days we spent on the Shackleton. Most of these were on the western side. To maintain the maximum amount of heat in the tents, it was necessary to set up the camp in such a position so that the sun would always shine on it. This usually necessitated placing the camp away from the valley walls in order to avoid shadows. We also tried to place the tents on snow when we could find it. The tents had to be pegged down with metal pins, and they were difficult to drive into ice, and then did not hold well. We sometimes had to melt

snow and pour the water around the tent pegs so that they would freeze in. It may sound strange to say that it was sometimes difficult to find snow in Antarctica, but the strong winds seemed to keep the glacial ice blown free of snow.

Glacier Crossing

Eventually we reached the point where time ran out on us, we had proceeded as far up the glacier as far as our time would permit, and it was necessary for us to cross the glacier and proceed down the glacier on the other side. The glacier was about five miles wide at the point at which we finally decided to cross. We dreaded the crossing, as we knew that it would not be easy. It would not have been so difficult had it not been for Swithenbank Moraine. This particular project proved to be the most physically challenging of the entire expedition. The moraine consisted of material varying from sand size to boulders weighing a ton or more. It was geologically interesting because these rocks gave us an indication of the kinds of rock to be found further up the glacier than we had been able to penetrate.

Crossing the actual moraine was not a problem. It was about a mile wide, and we could easily walk across it. What was not easy was getting the toboggans, the sleds and our gear across. As I have said before, both the toboggans and the sleds were designed to travel on snow, and they did not respond to travelling on dirt and rock any better than they did on glacial ice. Once we got there we found rock exposures not to be as abundant on this side of the glacier, and many of these difficult to reach by toboggan.

We found that the best way to cross the moraine was to concentrate on one toboggan or sled at a time. Wade would walk ahead and plan the route to travel, and Greenlee and I would push and shove the vehicles as well as we could. I'm sure that the rocks were hard on the ruddles, but we finally mushed our way across. We had a good day for it, and since the sun did not set, we just worked continuously until we finally had everything across. It was exhausting work.

At one time I was lying on my back with a toboggan on top of me, and I looked up at Wade who was staring down at me laughing, and I said "What the hell are we doing here"? This was a question I asked myself a number of times while I was on the Shackleton. But when you threw back the flap of the tent in the morning on a bright, sunny day and looked out at the dazzling picture of soaring, snow-covered mountains framed by the azure blue sky and equally blue glacial ice, it all seemed worth it.

After we had struggled through a very hard day, we tiredly raised our tents and set up camp on the opposite side of the glacier. After a good night's sleep we began the exploration of the opposing side of the Shackleton. We soon discovered that there were discrepancies. The two sides did not match. The huge mass of Mt. Butler did not exist on this side. We also found that the older metamorphic rocks were not the same on both sides. It made us suspect that the Shackleton Glacier might be following a geologic fault zone. It is not unusual for this to happen, as both rivers and glaciers often follow faults, as such ruptures in the earth are weaknesses in the earth that can be exploited by both these geologic agencies of erosion.

Exposed before us were more puzzling rocks from the basement complex. The younger rocks on this side, and their intrusion by thick diabase sills which are prevalent in this part of Antarctica were seen and studied in more detail in the 1964 season, and discussion of them is best left to later. I think that it was at this time that Wade decided that we had bitten off more than we could chew, and that we would need to return to the Shackleton for further investigation of the area that was beyond our reach and limit of time.

Most of our trip down the Shackleton was devoted to the study of the basement complex of rock that consisted of metasedimentary rocks and intrusive igneous rocks. The original sediments had been regionally metamorphosed into a greenschist facies. This is not a very high grade degree of metamorphism, so instead of finding beautiful garnet or staurolite crystals, we found ourselves stuck with great masses of greenish colored rocks infused with minerals such as chlorite and epidote. This often brought about from us such expressions as “My God, would you look at all those green rocks.”

Three people living together in a very close relationship in an isolated environment for a considerable length of time can reveal characteristics or quirks that might not be present or noticeable or ordinary circumstances. We had just such an environment on the Shackleton. By and large we got along together very well. We worked together and shared our labors with little or no friction. It was only at the very end of our journey as we were traveling down the glacier to the spot where we were to be picked up by a plane coming from McMurdo, that we had any emotional problems. Wade was certainly easy-going, and while he sometimes became depressed, and shared with me concern about the importance of the work we were doing, he always overcame his doubts, and, for the most part, was cheerful and well intentioned.

Greenlee, up until this point, had been an amiable, hard-working companion, cheerful and comfortable to be with, but even while half-joking, he had always been apprehensive about the cracks in the ice, and feared falling into one of them. There were certainly crevasses on the Shackleton, and some of them were big ones, big enough to drop a bus in. The danger was real while travelling across the glacier, but his fear of them became excessive, and, as we were to see later, approached being psychotic.

Crevasses had not been that much of a problem to us because we had been travelling mostly across glare ice or very thin covers of snow, and we could see the cracks and avoid them. As we traveled down the glacier, the snow cover became thicker, we no longer encountered glare ice, and we moved across crusted snow. Any crevasses in the area were now essentially concealed from us. Dave became so nervous about this that he



began to balk at moving over such surfaces. We had very little choice in the matter, as it was necessary for us to reach the mouth of the glacier in order to be picked up by a plane from McMurdo. Finally he just stopped, and refused to travel any further.

I was driving the lead sled, and Wade had hopped on the sled behind me. I opened the throttle and began to move quickly ahead. As the distance between us began to widen, Greenlee began to shout. Pretending not to hear him, I opened the throttle still more, and we moved rapidly over the surface. Behind us, he had little choice but to follow us or be left abandoned in the snow. I am not sure just how long this went on, but in time we did cover the treacherous area, and eventually arrived at our pick up point. He was a little resentful about our treatment of him, but it was largely offset by his appreciation at being safely across the crevasse field. His final remarks about our regard for crevasses were "I hope I never get like you and Wade."

I suppose he had a point, as the New Zealander flying an Otter out looking for us was quoted as saying "I found their tracks and followed them across the snowfield. They were crossing a crevassed area. The first toboggan would cross safely, the second would kick out the snow-bridge, and a series of yawning openings would be left behind them". Wade and I never discussed this aberration, of Dave's, and after such a passage of time, it doesn't make any difference anyway. Dave was not a coward. He was simply terrified of the possibility of falling into a crevasse.

We had hoped to visit Waldron and Longhorn Spurs, but neither the time nor the topography permitted this, and their exploration had to await our next visit to the Shackleton. While we were waiting to be picked up, Wade embarked on a special project. He had long been interested in the accumulation of meteoric dust found on the surface of the earth, and had conducted a study of material as it was received on the roof of the Science Building. In this study, he found that there was a slow but steady accumulation of meteoric dust. Now he wanted to see if there was this same sort of accumulation in Antarctica. We dug out a square meter of snow, and slowly melted it in a large pot over our small Coleman stove. It took a considerable time, but we finally finished the job, and found, indeed, that there was a very small residue of meteoric material remaining, just the same as there had been on the roof of the Science Building. Although we did not know it at the time, later exploration was to turn up an unusual number of meteorites on the Antarctic continent, and search parties were organized to look for meteorites.

Back to McMurdo

As a mentioned before, we had been spotted by a cruising New Zealander in an Otter airplane, and he reported our position to McMurdo. The Otter is a twin-engine plane, and makes an inordinate amount of noise. It buzzed our tent, and, and I thought an atom bomb had exploded. A couple of days later an R4D arrived and picked us up. They were operating in the neighborhood, but were not prepared to take us all the way to McMurdo. They dumped us off at the weather station located at the foot of the Beardmore Glacier, which was the very large glacier next to the Shackleton. The three-man weather station only consisted of a small hut, but they loaned us a nylon tent. It was not very large, but the pilot had dumped an enlisted man plus a Herman Nelson. A short time later the plane returned, loaded us aboard, and returned us to the luxury of McMurdo and the first hot bath in many days.

But this was not the same McMurdo we had left month before. The snow had melted from most of the area, and what remained continued to melt from the heat of the bright 24 hour assault of the Antarctic summer sun, which produced rivulets of running water, and made a muddy mess out of McMurdo's streets. Front-end loaders were scurrying around trying to scoop up enough of the remaining snow to produce the melt water needed. It was



paradoxical that while water was cascading down the streets, producing mud holes and bad tempers among the mud-splashed sailors and scientists, there was a genuine shortage of water to use for drinking and bathing. There was enough, however for us to have a much needed hot bath. We had an opportunity to catch up on our mail, and to put in phone patches to our wives. We also enjoyed the New Year's party at the officer's club.

Our remaining chore at McMurdo was to box up all our rock samples for shipment back to the States. Then we had only to wait for our own transportation home. Dave had been rather reserved since returning to McMurdo. Neither Wade nor I had mentioned his behavior coming down the Shackleton. We finally decided that he other problems of his own. His wife had been against his coming on the trip to Antarctica, and he never received a single piece of mail from her while there. For reasons of his own, he had decided that he wanted to return to New Zealand on one of the

icebreaker ships. I think that there were three of them in the Antarctic: the Eastwind, the Westwind, and the Glacier.

Meanwhile, as seasoned old salts, both Wade and I warned him of what he would be in for. These ships were small with thick hulls, and because they were designed to run up on floating ice and break it up by means of their own weight, they had almost no keel. This round-bottom structure caused them to roll and pitch wildly in a rough sea. And the Antarctic seas were notorious for being the cause for rough passage for small ships. He admitted later that his trip back had been a wild one.

Meanwhile, Wade and I flew to New Zealand on an uneventful but long trip, and found we found ourselves surrounded by the beautiful greenery of a Christchurch summer. The climate is wonderful at that time of year there, and we soon discovered that the natives take advantage of it by using the Christmas holidays as their vacation time. The stores close, and everyone takes off after Christmas for two weeks. Outside of the chemist (pharmacy) and the holiday business such as hotels and cafes, the towns are essentially closed down. We spent a few days with our host Mr. O'Malley at the Carlton, and flew to Hawaii.

Hawaii

Wade had arranged for us to have a delay in travel time in Hawaii. Accordingly, our wives along with Mrs. Wades mother and our son Greg (now Austin), were waiting for us at the Princess Kaiulani Hotel when we arrived at Honolulu. Hawaii was no novelty to me as I had been there several times during the late unpleasantness called WWII, but it turned out to be fun exploring it under peacetime conditions. Our hotel was near Waikiki Beach, and we spent some time swimming there. We also sang along with Don Ho at his nightclub and enjoyed the wonderful food.

Greg had a wonderful time at the beach, and spent a lot of time at the nearby market. He also served occasionally as an escort for Mrs. Wade's mother. She spent most of her time at a bridge tournament being held at the hotel. While she was at the tournament, the rest of us did the tourist bit by taking a tour of the islands. We flew to Hilo on the big island (Hawaii), and spent the night at an old wooden hotel that must have been built just after WWI.

The next day we rented a car and drove across the island. We visited the petrified-forest where ancient tree trunks were preserved by being covered by volcanic ash. We saw the black beaches composed of volcanic basalt sand, and after visiting numerous frozen volcanic flows, and stealing some sulfur crystals from a smoking sulfatara, we ended up at the Volcano House on the brink of Kilauea. There, after enjoying a good supper, we sipped a scotch while watching the steam arise from the glowing pit of the volcanic crater. As my sainted grandmother would remark "Hell wasn't a mile away".

The next morning we drove to the other side of the island to Kona, where we stayed at another wooden, WWI vintage hotel, and saw where flows from the volcano had plunged into the sea, adding new land surfaces to the island. We drank Missionary downfalls, and watched the sun set into the Pacific Ocean. We flew from there to Maui, and thence to Kauai before returning to Honolulu. Our holiday over, we threw our leis into the sea, and caught a Pan American plane back to the forty-eight.

We traveled first class, which, being as parsimonious as I am, I have not done very often, and it was a great experience. Big seats, free drinks, and a wonderful cuisine. We stopped off for a final fling in Las Vegas. There I was insulted by a blackjack dealer who looked to be about eighteen years old. He told me I did not know how to play the game. Hell, I was playing blackjack before he was born, but you have to play blackjack by the local rules. We returned to Lubbock the next day, spoiled by our holiday and a little reluctant to go back to work. It is ironic that our flight from Albuquerque to Lubbock was on a type of airplane that we had spent so much time with in Antarctica—a DC3, called an R4D by the Navy. What a difference it was from our Pan American flight.

Back in Lubbock, we found ourselves to be mildly famous. We had our pictures in the paper and had an interview over the local television station. Wade had made a 16mm film of our adventures, and it became my job to show the film. I must have shown that film fifty times to schools, church groups, service clubs and bar mitzvahs. I even got paid as a professional speaker from several of them.

We had a lot of lab work to do on the rocks and minerals when they finally arrived in Lubbock. And then it was back to teaching. A number of other Texas Tech University scientists from different fields as well as our University president would end up making the trip to the southernmost continent, but we enjoyed the fame of being the ones who paved the way. It would be another year before we would return to Antarctica for the second time.

The Shackleton Glacier Revisited

The Second Expedition: 1964 - 1965

Dr. Wade was satisfied that our work was complete on the Shackleton. We did not penetrate as far up glacier as he wished, and we ran out of time. He applied for another grant from USARP to complete the study of the upper Shackleton. He also made a deal with the U.S. Army for helicopter support for a portion of the time that we would be on the glacier. These were *Hueys*, the same type of helicopters that were being used in the Viet Nam War, which was still going on at that time. The pilots were also veterans of this conflict. This time we were also to have a larger land more diversified crew. We would continue to use toboggans when the helicopters were not available.

In addition to Wade and I, would be joined by a 6 ft. 2 East Texan named Kirby LaPrade, a geology PhD candidate from Tech whose name was mispronounced even more often than mine. His beard was so heavy that he could shave every 15 minutes and still have 5 o'clock shadow. He would end up growing a full beard that was spectacular.

Also with us was a 5 ft 4 imp name John Shenk a Masters degree candidate who was to be the clown and the spark plug of our crew, and would always keep us laughing.

Rounding out the group was a fellow University of Texas geophysics master's degree candidate named Ron Everest who was a rather stolid individual, who had a shape like a barrel.

The time arrived for our embarkation, and we discovered that Branif, the world's largest non-scheduled airline, had frivolously cancelled our flight. We stood around in the Lubbock airport staring at one another and feeling foolish. Finally the airline restored the flight, and we took off for San Francisco. We spent a day and a night there where we enjoyed the local bistros, and found that in the intervening year there had been a sexual revolution in entertainment in San Francisco. From banging our beer mugs on the counter and shouting "play the wheat song", we had gone to observing near nudity in broad daylight. You could observe near nude nubile maidens undulating endlessly in a bird cage, something which aroused the libido of country boys, and which served to store up visual memories to be recalled later during cold, lonely Antarctic days. There were, of course, no Antarctic nights.

The next day we caught a plane to Hawaii. We did not linger long there. We landed at the Navy Air Base, stayed in barracks over night, and left the next morning for New Zealand. Our flight was an interesting if somewhat unusual. We were flying in a Navy R4D plane. This is a small cargo plane, and was older than most of the passengers and crew. By using this plane, it made it necessary to stop at a number of small islands along the

route to Christchurch, New Zealand for refueling, such as Canton Island and Pango Pango in Samoa.

Our Stop in Christchurch was a brief one as well, and we were quickly on our way to the White Continent. Our long flight over stormy waters, ice floes, and frozen ocean was uneventful, and upon landing, we were quickly picked up and installed in comfortable quarters in McMurdo Base. Two years had not changed the base much. Some new quarters had been built, and it had increased in size.

Back to the Shackleton

We went quickly to work, and it did not take us long to assemble our equipment. We had more personnel working, and we had our experience of 1962 to guide us in our selection of clothing, food, and equipment. We were again to take two toboggans, and an additional tent for the extra personnel. Our approach to exploration of the Shackleton was to be quite different from that of the previous season. Instead of having a series of camps based on our travel over the glacier, we were to set up a central camp. Remote and inaccessible areas would be worked by means of two Army helicopters, whose services we would have for two weeks. The camp would be centrally located on the glacier, and nearby areas would be reached by toboggan as before.

Our first frustration was caused by the inability of the Navy to fly their R4D,s out of McMurdo because of inclement weather. Twice we took off from McMurdo, only to be turned back because our area was socked in by whiteout conditions. Finally we were shuttled to the Shackleton and set down on a very good flat area above where McGregor Glacier emptied into the Shackleton. This was to be our home for the entire time we were to be on the glacier. We quickly unloaded our gear, and said good-bye to the Navy R4D, which did not linger, but took off immediately to return to base. We set up our tents and established our camp in short order in good weather.

Our schedule for use of the Hueys was set up so that we had time for near-by to be able to cover more territory. Kirby and Ron would work exploration on foot and by use of the toboggans. We split up into two parties in order the main channel of the McGregor Glacier. Ron was doing a geophysical study, setting up equipment to study earthquakes waves in the area. Kirby would later do his doctorate on the area, and would name the glacier LaPrade Glacier. Shenk and I opted for the sediments exposed on this hither to fore unexplored side of the glacier, which we had not been able to explore on our previous trip. This resulted in us ultimately making a detailed measured section. Wade split up his time between the two teams. We named the twin peaks, which made up these sediments, Mount Kenyon after Kenyon University, where Wade had received a degree, and where he later taught, and the other Shenk Peak (see map in appendix).

Mt Kenyon was the highest peak in the area that was possible for us to climb. Nearby Mt. Wade soared some 16,000 feet into the blue Antarctic sky, and while we did fly over it in a Huey and study it from the air, it was too formidable a challenge for us to climb it. It was largely sheeted by ice, and we could not have studied the sediments, even if we had been able to climb it. It was more a challenge for mountain climbers instead of geologists.

I had been chosen, so Wade had once told me, as someone he could trust to look after and offer a measure of protection for him against the dangers of Antarctic exploration, and up to that time, I had done a pretty

good job. I had kept him out of crevasses, and once hurled him into a snow bank when his hand was a living torch from gasoline from the Coleman stove. I always had his safety in mind when working in the field. But accidents do occur, and sometimes when you least expect them.

While walking across a rough, stony field of glacial debris on a relatively flat, unexciting appearing surface, Wade paradoxically stepped on a rock, tripped, and fell on this seemingly safe-appearing terrain, and broke two ribs. We got him back to camp safely, but he was in quite a bit of pain. Two days later a plane in transit stopped by, picked him up and whisked him off to the medical facilities of McMurdo station.

This left me in charge of the expedition. Kirby and Ron had work to do up LaPrade Canyon, and it was at this time that Shenk and I measured our section up Mount Kenyon. We were fortunate in that we were blessed with a period of good weather, land as there was no nighttime, we worked



around the clock, and finished the section within two days. We returned to camp to find Wade grinning at us, and seemingly in good health. They had taped up his ribs and sent him back to camp with an admonition to take it easy and not break any more ribs. Actually he did break more ribs, but this was two years later at Marie Byrd Land.

In contrast to our lonely trek two years before, we were besieged with company at this camp. When the Army helicopter crew came in, they brought a Life photographer named Rougier.

We entertained thoughts of the crew and Texas Tech being immortalized by being featured in an article in Life Magazine, but alas, it was not to be. It started off well. The photographer talked Kirby into taking him on a toboggan trip up LaPrade Canyon. Apparently he went into Antarctic euphoria over the scenery, and blew the whole scene. You would not believe that a professional photographer would be so culpable. He fell for the classic “just one more step back”, except he was the fall guy doing the stepping. He backed off onto a steep slope, slid down an ice slide, and eventually ended up at the bottom of the slope where he stopped himself by banging into some huge boulders. The result was a broken leg, a cracked pelvis, smashed camera equipment and numerous cuts bruises and contusions.

We first became aware of the accident when Kirby came thundering up on the toboggan, and with a white face and a shaky voice managed to

croak “I want a doctor and a helicopter.” We did have the helicopter, and the army had a medic. They were both dispatched, and soon returned with the shattered photographer. The medic was quick to admit that his injuries were far beyond his limited ability to heal. A message was sent to McMurdo, and a plane soon landed on our field and removed the injured photographer, and he was sent back to the states. We waited patiently for news about him to show up in Life magazine, but apparently they really did not want to advertise the accident. The poor man had never had an opportunity to snap a picture, and the only item ever printed about it in Life was a few lines saying that he had been injured, and a hill had been named for him.

Helicopters

Things became more animated with the arrival of the helicopters. These were Hueys, and flown by army pilots instead of Navy pilots. The Navy had helicopters in Antarctica, but they were Sikorskys, and not suited for long range, high altitude flying, as were the Hueys. The Army brought with them their own dog and pony show. They had in their crew three pilots, two mechanics, a radioman, a cook, and a medic. They set up their own tents, brought their own food, and generously shared it with us. There was to be no food bars or dehydrated food for this crowd. They traveled first class. This was their first experience flying in Antarctica, but most of them were veterans of the Viet Nam War, and were experienced pilots.

With the use of the helicopters we were able to expand and accelerate our explorations, and examine areas quickly that would have taken weeks, or been impossible with toboggans. Just as the use of toboggans had been a leap forward in Antarctic exploration, the use of helicopters was



to be a quantum leap insofar as geologic exploration was concerned. We were able to make a visit to Waldron Spurs, a location denied to us on our previous trip. It was an interesting area of tilted and folded beds that had been eroded to produce a series of wing-like topographic features that we called spurs. They consisted of sediments that had been folded and metamorphosed. One of the most interesting of these sediments was a quartzite conglomerate consisting of walnut sized quartz pebbles in a matrix of white quartz. It was while climbing the stair-stepped ridges of one of these spurs that I almost became an Antarctic statistic. The bedded ledges made excellent steps for climbing, and our whole crew was strung out along the slope of the hill. There were patches of snow and bare rock, but climbing was relatively easy.

It was a warm day for Antarctic weather, and there was a hot, brassy sun shining brightly. While I was standing on a ledge examining a rock specimen with my hand lens, the melting action of the bright sun beating down on the snow above me released a dump truck load of snow that neatly knocked me from my perch. I joined the snow in a trip downward, taking time to bounce off individual ledges and boulders encountered on the way down, until I finally managed to cling to a boulder several hundred feet down slope.

It was one of those things that happen suddenly and move swiftly, but the events are registered on your brain like a series of single shot photos. I was not knocked out, but jarred and bruised beyond belief. I lost my glasses, my cap, and my dignity. I would have lost my hand lens, but it was looped

around my neck. Every fingernail was broken down to the quick, and my fingers were bleeding as a result my grabbing at rocks and boulders on the way down, trying to find something solid to hang on to. After seeing that I was all in one piece, Wade remarked “It’s a good thing that you landed on your head, otherwise you might have gotten hurt”.

Shackleton Geology Part II

Another advantage of the helicopter was its ability to land on the tops of peaks along the glacier, where before we were only able to study the glacial valley walls. It allowed us to study in some detail the occurrence of a unique igneous rock structure of a unique mineral composition. These structures are called dolerite sills. Dolerite is a British name for a dark colored, fine-grained igneous rock. Americans usually use the name diabase for such a rock, but the British first studied these rocks, and so named them. Sills are horizontally layered intrusions of igneous origin. These dolerite sills are unique in that they occur only in a few places, and for the abundance of their layering without seeming to disturb the country rock other than displacing it vertically. These sills occur in amazing abundance, and looking at a cliff face where they exist, one is reminded of a chocolate cake. In some places their abundance was so great that the thickness of the beds had been increased by thousand of feet.

Another rock occurrence of great interest to us was the Ferrar Basalts, a series of extensive volcanic flows found at the edge of the polar plateau. These were vesicular basalts whose vesicles were filled with beautiful mineral crystals. Beautiful crystals of calcite, stilbite, rock crystal quartz and amethyst become exposed, and litter the area where the rock has been broken open. Unfortunately we were only in the area for a short time, and were unable to collect as many of these minerals as we would have liked.

At this period of time the science of geology was being radically influenced by the theory of Continental Drift. Older geologists such as Wade and I were highly suspicious of it. Younger geologists found it a new and exciting concept. The evidence for a spreading earth is compelling. Many of we older geologists were dragged kicking and screaming into accepting such radical concepts. We observed on the Shackleton the presence of dolerite sills that are similarly represented in India, South Africa, and South America. We found the unique plant fossil *Glossopteris*, which is also found in these same locations. Conviction came slowly, but the evidence seen first hand was compelling and hard to resist.

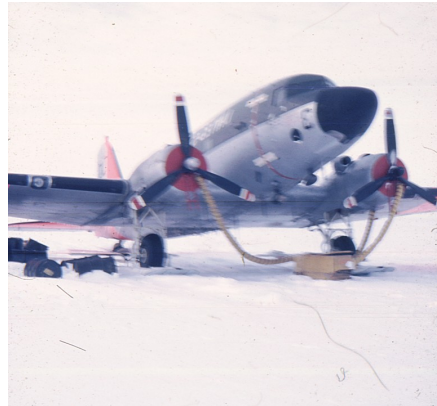
All good things must come to an end, and they came all too soon when our helicopter friends bundled up their gear and flew away to other duties. It was a lonesome place after they left. We did what work that remained with the use of our toboggans, and then prepared to leave ourselves. Wade and I had told the rest of the crew that going back down the glacier with the toboggans would be easy because there would be little snow, and we would be able to avoid the crevasses for the most part. Little did we know that the year we had been gone had been a wet one, and where we had little snow cover before was now well covered.

Shaky Landings

We had crossed the glacier to the other to avoid the danger from crevasses that we had run into before, only to now find that this side was snow covered as well. But we crossed Swithenbank Moraine for the last time, and made a shaky but rather uneventful trip down the glacier, following our old route of two years ago. We finally reached the mouth of the Shackleton, and waited to be picked up and returned to McMurdo.

We remained at our final camp for a number of days. We were always conservative campers, and tried to leave the area in as pristine a condition as when we arrived. Crevasses were always convenient receptacles for our garbage and trash. It always was amazing to me to find that after we had been in a camp area for only a few days, skua gulls invariably would visit our garbage dump. How were these birds able to fly over 500 miles just to forage our dumping ground?

We had one more adventure awaiting us before we were to leave the Shackleton. An R4D plane arrived to pick us up. While landing the plane ruptured a hydraulic line and spewed the bright red fluid over the white snow. The line was the one that controlled the flaps, and consequently we would be unable to use them during take off. To overcome this problem it was necessary to attach four JATO (jet assistance take off) bottles. These jet bottles were attached to act in two directions. First, two were fired when the plane had reached its top take off speed to help lift it off the surface of the snow, and at just that point the remaining two were fired to maintain its position in the air. This required rather delicate timing. I was not particularly concerned about the situation until I discovered that the enlisted crewman shaking in fear and packing himself in life jackets just before we took off.



But his fears seemed to be groundless as everything worked just as it was supposed to, and we bade farewell to the Shackleton. Our troubles were not over, however. As we approached Williams Field to land we were sent to a distant runway. We still had no flaps, which meant that we would have to land a high speed, and roll for a long distance. We dumped all our fuel, and with a small prayer made a hot landing. Our good luck held and we landed safely after rolling what seemed like an eternity. In retrospect, I think, while we may have been lucky, our success was more likely due to the skill of the Navy pilot. We gladly endured our long ride to headquarters at Williams Field, and eventually another ride to McMurdo Base where we enjoyed a shower, clean clothes, and a drink in the officer's club.

While waiting for transportation to New Zealand, we were kept busy boxing up the specimens we had collected in the field, and getting them

ready for shipment to the states. These would be sent via ship, and we would be back in Lubbock long before they got there.

Island Hopping

There was a serendipity we received in going to Antarctica that offset the tedium of long, boring trips over dangerous waters, and this was that we had stopovers in Christchurch, New Zealand, and Honolulu, Hawaii. Sometimes these were of short duration, and sometimes we might have stopovers of several days. Usually it was a matter of waiting for transportation. This season we had a surprise waiting for us in Christchurch. Our wives, (Wades and mine) were waiting for us there. They had a long story to tell us about planning the trip, and their adventures along the way. Through days of wrangling with travel bureaus, they finally found a freighter bound for New Zealand that carried a limited number of passengers.

They secured tickets, flew to New York, and climbed aboard the Elan Haven, a small Norwegian freighter. They made their way down the East Coast, traveled through the Panama Canal, and slowly made their way across the Pacific to New Zealand. There they disembarked, but in Auckland, on North Island, not on Christchurch which is on South Island. They managed to rent a car and make their way, driving on the left side of the road, until they reached the place where they could catch a sea going ferry.

This brought them where they wanted to go, and with only a little more trouble, they made their way to Mr. O'Malley's hotel, where they were waiting for us when we arrived. Fortunately Wade had enough influence with the National Science Foundation to secure us a weeks delay in travel, while Kirby, John, and Ron traveled on to Lubbock. New Zealanders take their vacation time at Christmas, as it is the middle of their summer. We joined the vacationers, and spent a week in New Zealand as tourists. Finally it was time for us to go, and while we flew home to Lubbock, they continued their travels, going to Australia for a week, and then flying back via stops in Samoa and Tahiti.

Marie Byrd Land

The Third Expedition: 1966 - 1967

My third trip to Antarctica came as a surprise to me. We had finished our studies on the Shackleton Glacier, made our reports, and I considered my Antarctic adventures to be over. However, Dr. Wade had more exploration in mind.

He had been a member of the first Byrd Expedition, which had worked out of Little America, and had as its goal the geological exploration of Marie Byrd Land. During the first Byrd Expedition, he had started out as a dog sled driver, and had later been put in charge of taking care of all the dogs. After returning to the states, Wade continued his education, and changed his major to geology. Byrd had been impressed by his enthusiasm and hard work, in Antarctica, and when the Third Byrd Expedition was being put together, Wade joined it as its geologist.

This expedition had been handicapped by a number of factors. These were particularly frustrating to Wade. He had started his Antarctic career as a lowly dog driver, and had worked his way up until now he was a member of this elite group of scientists as a geologist. He was in charge of the Snow Cruiser, a behemoth of a machine that was especially constructed for travel on the snowfields of Antarctica.

It had huge wheels each of which were driven by individual electric motors powered by an electric generator, which in turn was driven by a diesel engine. This machine turned out to be a dismal failure.

Apparently the architects failed to take into consideration the enormous weight of the machine. It would sink into the snow so that each wheel was continuously climbing up a 30-degree slope, even though the machine itself was on level ground. This condition would quickly burn out the electric motors, and this machine in which they had hoped to travel quickly across the Antarctic continent in fact traveled only a few miles. Wade eventually used it as his office and bunked there.

The failure of this machine was a bitter blow to Wade. Instead of being able to travel from one outcrop to another quickly, he was forced to return to the use of dog sleds for transportation, which severely limited the amount of work he could do.



An additional frustration was that while they were in Antarctica the world had become involved in World War II. Germany was suspected of using the old whaling camps in the Antarctic Peninsula as a fueling station for their submarines, and Admiral Byrd was advised by the government to modify their plans and return to the United States.

Now he wished to return to Antarctica and complete the geological exploration he had begun twenty-five years ago. Marie Byrd Land was in East Antarctica, completely across the continent our previous studies on the Shackleton..

Our previous pattern of exploration had been to go to Antarctica one year, and return to teaching the following year. We continued with this pattern, and 1965 found us again on our way southward. This time Wade and I had as our co-workers John Wilbanks, a New Mexican who had just finished his Masters degree in geology at Texas Tech, and James Suggs, another geologist who was working on his Masters degree in geology.

Our travel arrangements were to be quite different than they had been in our previous trips. We had thought that we would travel through San Francisco as usual, but we that were informed by USARP that we would bypass San Francisco. There would be no playing of the Wheat Song, or further exploration of that city's fleshpots. Instead we would fly to the Naval Air Station in Rhode Island, and arrange for transportation from there. We spent the night there and were upset because we could not get the football scores, but were inundated by a deluge of reports of hockey games and scores.

The next morning we boarded a military Boeing 707 and along with other scientists and military personnel, over flew San Francisco, and traveled non-stop to Honolulu. The military 707 is like any other 707 except the seats faced backwards instead of forward. This was a very long flight, and Wade in his usual fashion promptly went to sleep and slept away most of the flight. I, on the other hand, being a white-knuckle flyer, needed the help a numerous secretive swallows of bourbon until I finally reach a condition of numbness, which was not sleep but a somnambulant stupor.

We stopped overnight at the Naval Air Base in Honolulu, and left the next morning for New Zealand, so that we had no tourist time in Hawaii. We landed in Christchurch and were billeted overnight in a down town hotel. The next morning we boarded a plane and flew directly to McMurdo station. This was an unexpected demonstration of travel efficiency by USARP. It was a fast but safe trip.

We did not spend much time in McMurdo before going to Marie Byrd Land. We discovered that scientific fieldwork was rapidly changing in Antarctica. We had been early participants in the use of snowmobiles as a substitute for dog teams, and also the use of helicopters for rapid transportation to otherwise inaccessible locations. USARP had decided additionally to combine the two travel tools as well as combining the different scientific specialists involved in field research. It was further

decided that a large central camp would be established in Marie Byrd Land, and that the whole area would be studied at the same time by a number of scientific disciplines.

Both snowmobiles and helicopters would be utilized, with the nearby localities being accessed by snowmobiles, and the more distant one reached by use of helicopters. If necessary, several different disciplines could share the same helicopter to visit the same locality.

Guess who was selected to set up the new camp? Due to his experience in Antarctica and in Marie Byrd Land, Wade was to be in charge of setting up the camp, and our crew would be responsible for its erection. We were flown to its location, and the plane dumped us out along with all the paraphernalia necessary to set up the camp and have it ready to accommodate the people who would be working in this area.

Base Camp

Wade had selected an open area, flat lying, and a considerable distance from the several mountain peaks that could be seen in the distance. There we were, three geologists and a frightened sailor, all ruefully watching our C-130 rapidly grow smaller until it disappeared into the distance. As old Antarctic hands, Wade and I were not overly concerned, and Wilbanks and



Suggs, trusting our judgement, were not particularly concerned either, but that poor radioman third class was terrified.

It was a bright sunny day without a cloud in the sky as we set about establishing the camp. We put the sailor to work with his radio equipment, while we set up our tents. Although it was sunny, we did not wish to be caught in a sudden blizzard with the camp half set up. Once we had two tents erected, and a head location established, (remember — don't eat the yellow snow), we began the job of making a barrack building out of the pieces scattered about in the snow. This was a Jamesway hut, patterned after the famed Quonset huts so well known in World War II.

The Jamesway huts differed in that they were much lighter in weight, and much better insulated. They were also much less expensive. Instead of being made of metal, as were the Quonset huts, they were made of plastic except for the lightweight, half moon arches upon which the insulated plastic rolls were laced. The plastic was double lined and stuffed with insulation in between the layers. We first had to put the floor together. This was made of wood, and had been the containers for the plastic rolls.

Once they were put in place, the metal arches were bolted together, and the insulated canvas strung between each section. With the roof in place, we hung the plastic and canvas material that made up the ends of the building. Doors were put in place, and the oil heating system installed. Finished, we stood back, and looked at our handiwork, we were well pleased with what we had accomplished.

I do not know how long it took to put together our masterpiece, but since the sun never sets, and it was sunny and calm, time did not matter. As we admired our handiwork, we could not help but reflect upon how this contrasted with our camp sights on the Shackleton Glacier. Actually we refused to sleep in the hut, preferring the privacy of our tents. As a final act, we planted our Lone Star Texas flag along with Old Glory and a red trail flag with a double T on it in black. Only then did we instruct the radioman, who by now had calmed down, to contact the base and inform them that we were now ready to receive guests.

Yeats Army Airfield

As well as I can recall, it took us about twenty-four hours to do the job. We rested, and killed time by tinkering with our toboggans. The camp was located in a flat-lying snowfield with mountains sticking up all around us at a distance. We did not have long to wait. Three helicopters buzzed the camp, and a C-130 cargo plane followed close behind them, loaded down with our food, fuel, and eager scientists. Also included in its cargo were two smaller Jamesway huts, one for a mess hall and one for the helicopter crews.

One other contrast between this camp and our Shackleton camp, was the difference in our food. The Army helicopter crews believed in traveling in style. There were no fish-smelling food bars or jars of Marmite for this camp. These Army helicopter pilots certainly knew how to travel first class, and they shared their largess with us. We had as part of our food supplies, frozen steaks shrimp and trout, along with an abundance of frozen vegetables.

We had our own cook, and to our delight, we discovered that he was also a baker. He furnished us with wonderful fresh-baked bread and other baked goodies. I think that bread was the food we missed the most on the Shackleton. And, wonder of wonders, we had a small snow-melter to furnish drinking water, and occasionally we were allowed to enjoy the luxury of a bath and a change of underwear. We always had plenty of H₂O. It just wasn't in a form convenient to use. Many hands made short work of the task of setting up the two small huts, and we soon completed the task. How wonderful it was to eat a good meal at a table full of people chattering away.



Yeats, Wilbanks, Suggs, Wade

It was necessary to set up a schedule for the use of the helicopters. These were in constant use if the weather permitted it. We were fortunate in this respect. We had relatively good weather except for an occasional blizzard that would turn our peaceful camp into a white nightmare—The dreaded Antarctic whiteouts. Dr. Wade and the Major in charge of the helicopters considered everyone's requests for their use, and rationed their time as the weather permitted. Quite often we were able to combine the work of several disciplines in the same helicopter. For example, geologists and biologists could travel together and examine the same locality at the same time.

This camp became an official Army Airfield, albeit a temporary one. We had a brief ceremony to dedicate it, and it was decided to name it Yeats

Army Airfield. It was quite an honor, even though it would have only a brief existence. The honor should have gone to Dr. Wade, but since he already had an airfield named for him on the Shackleton Glacier, the honor came to me by default. The Army was prepared for any contingency, and a sign was soon in place announcing the name of the field. The Major in charge promised to keep it and send it to me when the camp was closed. He kept his word, and many months later he sent it to me from their home base in Virginia.

The Geology of Marie Byrd Land

The geological exploration was very different from that of the Shackleton Glacier. There we were concerned with a relatively small area, but we had very good vertical exposure. We used the toboggans to move from one locality to another nearby. When the helicopters came, we were able to visit otherwise inaccessible areas. In Marie Byrd Land, we were not involved in studying a relatively small area such as that represented by confining glacial walls of rock, but instead we studied rocks that were exposed on mountain tops devoid of snow and ice, and that were scattered over a very large area. We had the use of three helicopters, and this allowed us to have the ability to visit these widely scattered locations. Also, we found that we encountered almost exclusively igneous and metamorphic rocks. We found that there was little correlation of the rocks from one scattered peak to another, and that there was an amazing diversity of rock types. Some peaks would be simple; coarsely crystalline granites, and others would be tortured, twisted masses of metamorphic gneiss, while still others consisted of sediments that had been metamorphosed into monster, monotonous masses of schists, phyllites, and amphibolites.

This area had been examined in some detail by the earlier second Byrd expedition, and they had named the more notable geographic features. Because we examined it in more detailed, we still named a number of new features. One of the more interesting of these we discovered was a group of volcanic peaks that had ejected a tremendous number of volcanic bombs. These bombs which littered the area around the peaks were black because of their outer coating of black basalt. When broken, open, they were discovered to be chunks of granular crystalline olivine. These chunks of olivine had been ripped from their position deep within the earth, and carried along by the up surging liquid basalt. They had been rudely cast around the volcano, and there they lay as solid bombs while the liquid basalt drained away. The basalt left the evidence of its presence in the thin covering of the chunks of olivine. Only when they were broken open was the beautiful green of peridot (the gemstone name for such olivine) revealed. In some areas the bombs had been scattered by weathering and wind erosion so that they presented a beautiful scintillating carpet of green. Olivine bombs of this kind are found in several localities in Antarctica. In fact, they can be found around the McMurdo base, but seldom are they ever found in such abundance. We found out later that they seem to be identical with the olivine bombs found at Kilbourne Hole in New Mexico.

We were fortunate to have with us for most of our stay, a mapping unit of the United States Geological Survey. This unit usually accompanied the geologists whenever we visited a mountain peak convenient for them to establish a mapping point. They would shoot in with their theodolites the various peaks that were visible. Their instrument location would become a map location, would be given a name, and this name along with the elevation would be inscribed on a brass marker which would then be set permanently in the rock, or if no rock were available, would be set in concrete. The competition to have your name on a U.S.G.S. map was intense. There was a *Pappy* marker and a *Gregg* marker. Sorry Austin, but the Antarctic continent knows you as Gregg, and it is set in stone. Brass copies were made and given as souvenirs.



It became customary in Antarctica for countries as a matter of courtesy to exchange scientists. We were fortunate to have as our exchange scientist a Russian geologist, Dr. Klimov. He was a very quiet person, stolid, almost to the point of seeming moody. This might have been partially due to the fact that he spoke very little English, and of course no one in the whole group spoke any Russian beyond “Tavorish”. He was short in height, stocky, and stout, built very much like myself. He was almost completely bald, and had only a short bit of hair crowning his head, which gave him monkish appearance.

With his rudimentary English he finally was able to explain to us that as a young boy during the siege of Stalingrad he and his family almost starved to death. They used some motor oil to cook what food they had, and he became ill and lost almost all his hair. He made a welcome addition to our crews, and we enjoyed having him with us. He carried a huge hammer, almost like a mallet. It had a long handle, and, like a true geologist he used to love to smash rocks with it. His favorite expression was “Antarctica very poor continent”, meaning that no minerals of economic importance were being found by us, not even good mineral specimens. He admired Dr. Wade very much, and was responsible for him being awarded the Belinhausen medal. This medal was awarded only to famous foreign Antarctic explorers, and was a great honor.

Dr. Wade was very distressed some time later to discover that Dr. Klimov incurred the wrath of the communists in power, and had been exiled to Siberia. He tried to gain some additional information about him, but learned nothing. Much later when we were on better terms with the Russians, and when Ouida and I were visiting in Russia, we made inquiries but could find no information concerning him.

We were not overburdened by a hectic social life at Yeats Army Airfield, but it was a lot more active than our time spent on the Shackleton. We had conversations over coffee at the mess hall, political discussions in

the barracks, and even a drink of whiskey now and then, but no drunken debaucheries. Dr. Klimov was very circumspect about his liquor consumption. He would come in from the field, take his hat from his bald pate, reach for his bottle of vodka, pour a stiff shot, raise his glass in a salute, quaff the whole lot off in a swift backward toss of his head, and then cap the bottle. That is the only way and the only time anyone ever saw him partake – his one-a-day drink.

There was not as much time for socializing or bull sessions as you would think because of the fact that we had day light 24 hour a day, and when the weather was good, most of the group would be away from camp. Only when we were having a storm or a white out would there likely be a large group congregating in the barracks. We did have one lapse of dignity when during a bad stretch of weather we decided to turn the barracks into a nightclub. Temporary tables were set up. Then someone had the brilliant idea to call it a Playboy nightclub. Of course in a Playboy nightclub, you must have Playboy Bunnies. I, and some other equally inappropriate person, with a swatch of cotton procured from God only know where attached to our rear end, served as poor substitutes for authentic Playmates,

As I have mentioned before, one of my major responsibilities while in Antarctica was to see that Dr. Wade did not fall into harm's way. I failed him once on the Shackleton, and I was to fail him again in Marie Byrd Land through no fault of my own. Dr. Wade was out flying in one of the helicopters.. He was with some of the USGS mapping group, and none of our crew, were aboard. Our weather was good in camp, but apparently they ran into some wind, and the ground became invisible due to the flying snow.

This becomes a pilot's nightmare when he cannot see the surface of the ground. This occurred to the major flying the plane, and he smacked it into the ground. Some of the people outside saw the plane disappear in a flurry of snow. After some discussion with the Army Lieutenant who was in camp, we took off in a couple of toboggans toward the scene of the crash, about three miles distant, we found the helicopter and the crew scattered all over the landscape. It wasn't quite as bad as it looked. The medic broke his arm, Dr. Wade got another broken rib, and the rest of the crew sustained only minor bruises and contusion. The helicopter was a total loss.

We loaded the casualties into the toboggans and took them back to camp. This put a crimp into our plans. We still had a lot of work to do. The medic flew back to McMurdo, and Dr. Wade had his ribs taped up. The Powers that be got their heads together to determine what to do while we got along with one less helicopter. It seemed like no time at all, but it must have been several weeks when a C-130 landed bearing, like Jonah and the whale, a brand-new helicopter in its belly. For once USARP, the Navy, and all concerned worked in perfect harmony, and we had a new helicopter, painted white, and covered with Christmas decorations, and with a Christmas card attached from the workers who had assembled it.

Last Flight on a Connie

The time finally arrived when it became necessary for us to say goodbye to Marie Byrd Land. We packed all our gear and collection of rock samples. We stood by, watching the sky and finally saw a small black dot turn into a C-130 airplane that quickly landed, its engines kicking up a huge flurry of snow. The ramp came down and disgorged a new crew of geologists and other scientists. We shook hands, briefly visited with them, and were whisked away. We were quickly airborne and arrived at McMurdo without incident.



Our stay there was a brief one. We had time to crate our samples, Call home to our spouses, have a drink at the officer's club, and it was time to fly again. We were hauled to Williams Field along with our baggage, and found awaiting us, not a C-130, but a pre-war Constellation. This plane, unaffectionately called the *Connie*, was constructed during the middle 1930s. It was the first plane built to fly light cargoes from the North American continent to Hawaii non-stop.

It was a good plane for the times, but it was dated, and had long been superceded by more modern planes such as the C-130. I almost wished that I had taken one of the icebreakers as Dave did. Almost, but not quite. It had some unique characteristics with which we were not acquainted. It was difficult for the pilot to keep it in trim if we wandered about while in flight. We were cautioned not to all crowd forward when we landed, as it was likely to tip over. Also, it was not pressurized, and therefor could not fly at high altitudes. We were thus always exposed to the whims of weather, being unable to fly above it.

We landed in American Samoa to refuel. We were there only a short time, so all that we saw of Samoa was the airport. The airport guards would not even let us walk down to the beach. We could drink a coke in the café, or go to the restrooms, but don't go near the water. I would like to have seen *somoa* of Samoa.

Our next stop was in Hawaii where we stayed overnight. We stayed in the barracks at the Naval Base, and did not even have a chance to have our shoes shined at the topless barbershop at the airport. We left the next morning, and after a bumpy ride across the Pacific, finally arrived in San Francisco. We were at the Naval Airbase, but need to be at the airport, which we could see across the bay.

Since we had no boat, we had to detour an interminable distance by taxi at an outrageous cost. We left Dr. Wade behind to continue his trip on the *Connie*. We learned later that they had to make an emergency stop on the way to change the plugs on the *Connie*. Meanwhile the rest of us caught

a commercial plane to Denver. Ouida, Greg and John's wife along with Jim's fiancée had driven up to Denver to meet us. We had a wonderful time in Denver, and then drove to Lubbock. Thus ended my last experience with Antarctica. Dr Wade was to make two additional trips to Antarctica. He asked me to accompany him, but I declined. Been there—done that. It was a situation similar my experience in WWII. It was a great adventure, I saw a lot of country, and I met a lot of good people, but I would not want to repeat it. In the case of Antarctica, it took three trips.

Antarctic Expeditions Today

A lot of people have made the trip to Antarctica . Dr. Calvin Barnes was an old hand before he came to Texas Tech, but he was in an area far removed from the Shackleton. As mentioned previously, a number of students worked oh advanced degrees in Antarctica under his direction. Still others from Texas Tech would go to Antarctica. along with Dr. Chatergee. The Biology Department later on sent a group there. All in all, quite a contingent of scientists from Texas Tech participated in Antarctic exploration. I like to think that we paved the way for them. A lot of changes in Antarctic exploration have taken place. It is a long jump from Scots man hauling, Shackleton's ponies, and Amundsen's dogs to today's jet planes and helicopters.

In retrospect, I would like to think that our sojourns to the Antarctic exploration accomplished something. Such programs such as the British Commonwealth's Trans-Antarctic Expedition, in which Vivian Fuchs and Edmund Hillary bulldozed their way across the ice with massive tracked vehicles, contribute little to science or to the world's information. In a demonstration of pure guts and determination, two women, both over forty years in age, accomplished a similar cross continent trek, using only light sleds.

They man hauled, or rather women hauled them, but augmented their progress by the use of sails to take advantage of the strong Antarctic winds. They crossed the Ice Sheet to the South Pole Station where they restocked their supplies. After a short rest they their resumed their journey, crossing the dome of the Ice Sheet at over 11 thousand feet, and where they encountered extremely cold temperatures. From there they would descend from the Ice Sheet to the Ross Ice Shelf via one of the glaciers that transected the formidable Queen Maude Range.

The glacier they chose was the SHACKLETON. It was a matter of some satisfaction to me that they called it a descent into Hell, and proclaimed it the toughest part of their trip. They were somewhat shocked by the lack of snow, which resulted in great sheets of glare ice. The ice was impossible to ski on, and necessitated the use of crampons to be able to even walk across the ice. They also complained about the number and size of the crevasses they encountered. If they had only asked me, I could have told them about conditions on the Shackleton. Never the less, it was a tremendous endeavor, and I tip my hat to the ladies.

Epilogue

Some forty years after the fact, it is interesting to take a look at what happened to all the individuals concerned with these three Antarctic excursions. Dr. Wade continued his Antarctic work with three more trips to the continent. He continued working for a number of years until his death in 1978. Upon completion of his thesis at Texas Tech, Dave Greenlee went to work with Magnolia Petroleum Co. I only saw him once after that. He was his same old jolly self, but he had gained about fifty pounds go along with his joviality.

The second excursion included besides Wade and I, John Schenk, Kirby LaPrade, and Ron Everett. Schenk finished his degree and moved to Denver and went to work for Texas Petroleum Company. As last reported, he was still working in Denver, and doing very well. Kirby LaPrade finished a doctor's degree at Texas Tech, and accepted a position as an Assistant Professor at East Texas University. Sadly, he was diagnosed with cancer and died a short time later. Ron Everett dropped out of school without finishing his degree and has not been heard from.

The third Antarctic crew included beside Dr. Wade and myself, John Wilbanks and Jim Suggs. John completed his doctor's degree at Texas Tech and became a member of the Geology Department of the University of Nevada at Las Vegas. Unfortunately he died while still a relatively young man. Jim Suggs completed his degree and accepted a position with a ship building company that specialized in ship conversions. Jim was hired to assist on ships modified to become able to do deep sea drilling and coring. He seemed to do well with the company, and in later years he sent his son to Texas Tech. I taught his son in my freshman geology class.

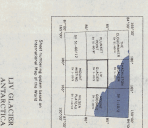
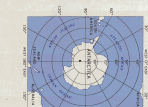
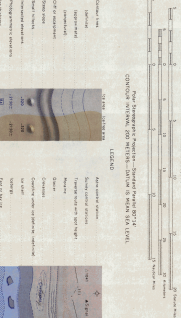
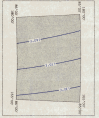
Appendix – Maps of the Shackleton Glacier Area

LIV GLACIER

ANATOLIA
1:50,000 RECONSTRUCTION SERIES



Map of the Liv Glacier region, Anatolia, showing the Shackleton Glacier, Mohn Basin, and various peaks and valleys. The map is oriented with North at the top. A scale bar at the bottom indicates distances in kilometers and miles. The map is part of the 1:50,000 Reconnaissance Series.



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Research Report Series

Texas Technological College

Department of Geosciences

Lubbock, Texas 79409

**The Geology of the
Central Queen Maud Range,
Transantarctic Mountains,
Antarctica**

**by F. Alton Wade, V. L. Yeats, J. R. Everett,
D. W. Greenlee, K. E. LaPrade, and J. C. Shenk**

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